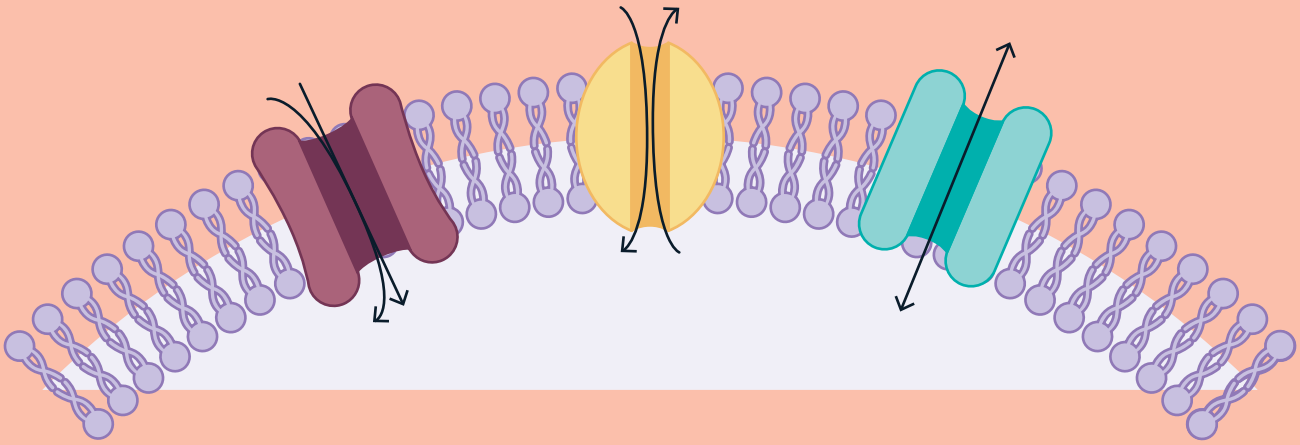
KACTUS

Solute Carrier Proteins

Custom Recombinant Expression



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Custom Expression Full-Length Solute Carrier (SLC) Proteins

The largest membrane transport group in humans is the solute carrier (SLC) transporters that consists of over 400 members classified into 66 families. The SLCs transport a broad range of substrates, including nutrients, neurotransmitters, ions, and drugs, and take part in numerous biological processes, such as regulation of cell signaling and organization of the cellular organelles.

Our dedicated team has explored a comprehensive list of full-length SLC family transporters, including:

- → SLC1A5
- → SLC7A1
- → SLC13A5
- → SLC15A4
- → SLC16A1
- → SLC16A3
- → SLC34A2
- → SLC40A1
- → SLC44A4
- → SLC59A1

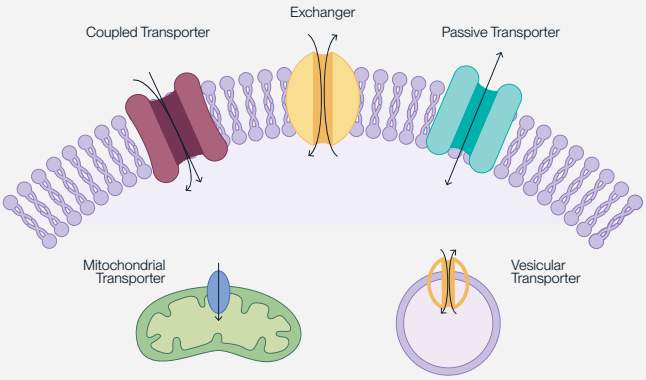


Figure 1. Types of solute carrier proteins.

6 weeks turnaround time

HEK293 Expression

Full-Length Proteins

Product Formats

VLP-Displayed SLC

Virus-like particles (VLPs) are small nanoparticles made from the shell protein of a virus. They form when one or more of these shell proteins automatically come together. VLPs do not contain viral infectious genomes, so they are relatively safe to use in production operations. VLPs are used to display multi-transmembrane proteins such as SLC proteins on their surface (see Figure 2).

Applications:

- → Immunization and Antibody Drug Discovery
- → Phage Display screening
- → Yeast display screening
- → PK/PD Studies
- → Analytical Tests, ELISA and SPR/BLI

Product Customizations:

- → Envelope VLPs
- → Non-envelope VLPs
- → Immunization guide
- → In vivo biotinylation
- → Fluorescent label
- → FACS compatible VLP

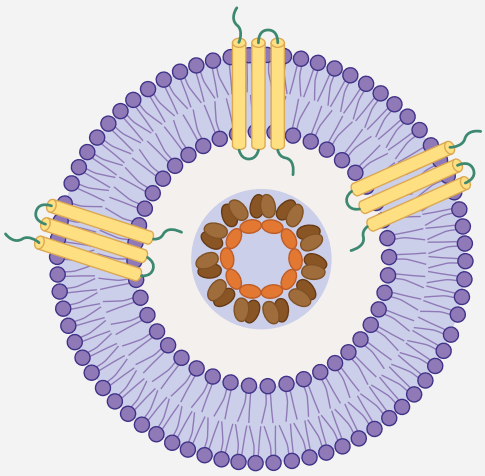


Figure 2. Envelope VLP displaying multi-transmembrane protein.

Nanodisc SLC

A nanodisc is a discoidal lipid bilayer surrounded by a copolymer or membrane scaffold protein (MSP). It is a nanoscale structure typically used in biochemical and biophysical research to study membrane proteins, particularly those that are challenging to study in their native lipid environment. Nanodiscs can be used to envelope multi-transmembrane proteins, while leaving the intracellular and extracellular domains free (see Figure 3). They provide a stable and controlled environment for membrane proteins, allowing researchers to study their structure, function, and interactions with other molecules such as drugs or ligands.

Applications:

- → Yeast display screening
- → In vitro functional assay
- → PK/PD Studies
- → Analytical Tests, ELISA and SPR/BLI

Product Customizations:

- → Copolymer nanodiscs
- → Biocompatible nanodiscs
- → In vivo biotinylation
- → Fluorescent label

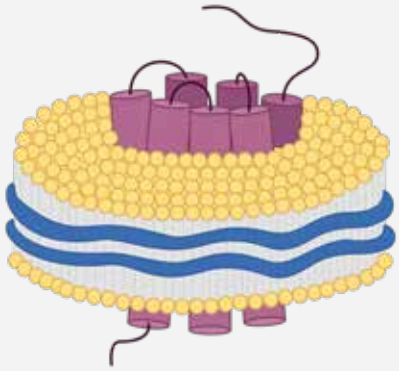
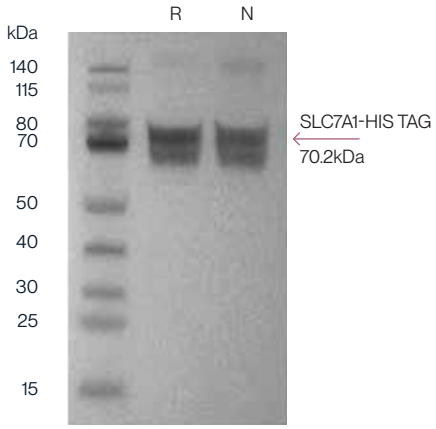


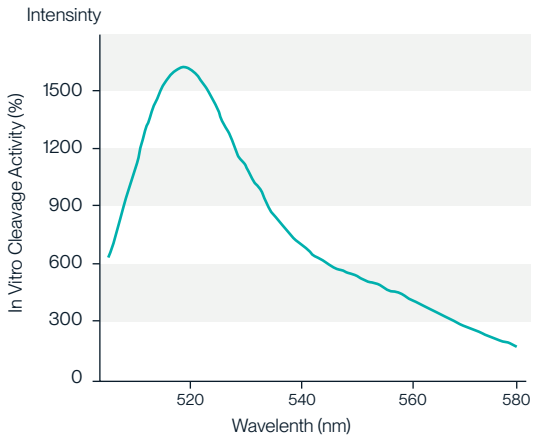
Figure 3. Nanodisc containing multi-transmembrane protein enveloped in copolymers.

Case Study: FITC-Equivalent SLC7A1 VLP



Anti-His Tag WB

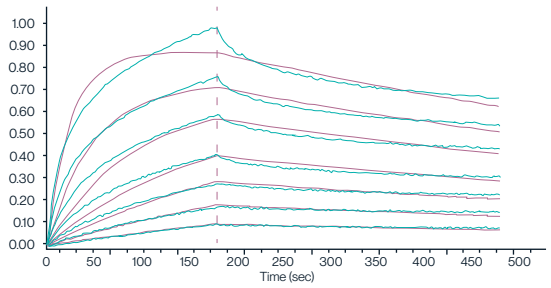
Figure 4. Full-length SLC7A1 membrane proteins with C terminus His tag (70.2kDa) were displayed on envelope VLP.



Fluorescent Scan

Figure 5. A fluorescent scan of FITC-equivalent SLC7A1 VLP was performed on a Varioskan LUX plate reader (Thermo Fisher). The VLP sample was placed in a 96-well Elisa microplate and measured at 25°C. The excitation wavelength was 488 nm, the emission wavelength was 510 nm, and the measurement range was 505-580 nm.

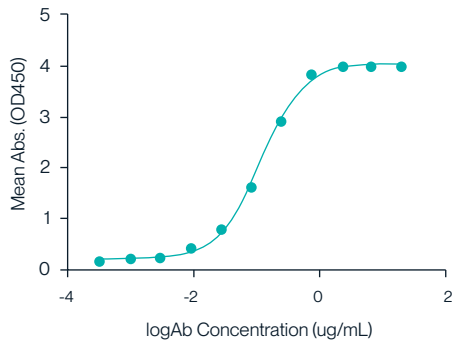
Case Study: Full-Length SLC13A5 Nanodisc



kon(1/Ms)	koff(1/s)	KD(M)
3.86E+004	1.10E-003	2.84E-008

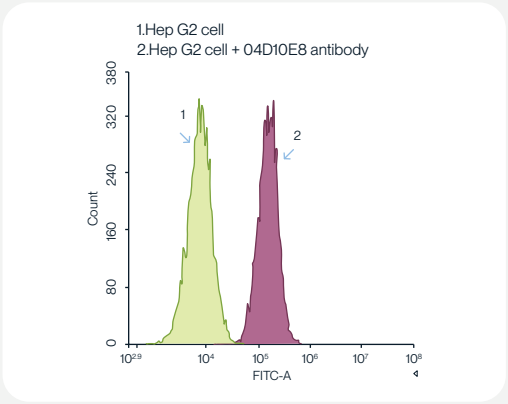
Biolayer Interferometry (BLI)

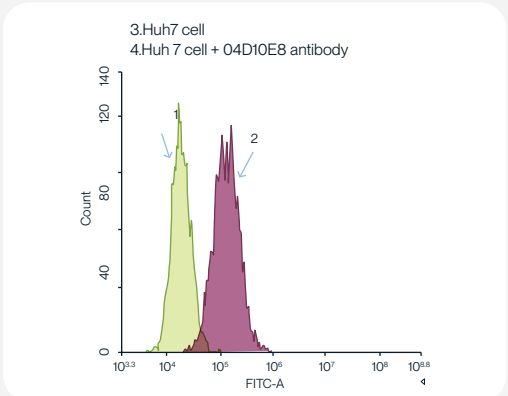
Figure 6. Full-length SLC13A5 nanodisc was tested using (biolayer interferometry). The His-tagged SLC13A5 nanodisc was immobilized on an Anti-His chip, and the binding interaction was analyzed using the 11H7B8 antibody at varying concentrations: 1023.33, 511.67, 255.83, 127.92, 63.96, 31.98, and 15.99 nM. The KD value of 28.4 nM indicates a high affinity of the SLC13A5 nanodisc for the 11H7B8 antibody.



ELISA

Figure 7. SLC13A5 nanodisc was tested via ELISA using 11H7B8 antibody. The plate was coated with human SLC13A5 nanodisc at 5 µg/mL, and the binding interaction was assessed using a colorimetric assay. The mean absorbance (OD450) was measured across varying concentrations of the antibody, resulting in an EC50 value of 0.14 µg/mL.





FACS

Figure 8. HepG2 and Huh7 cell lines overexpressing SLC13A5 were used for FACS. HepG2 and Huh7 cell lines (2E+06 cells/mL) were incubated with 10 nM recombinant 04D10E8 antibody. Following incubation, cells were labeled with an anti-mouse FC-FITC secondary antibody. The green peaks (1 and 3) represent the autofluorescence of untreated HepG2 and Huh7 cells, respectively. The red peaks (2 and 4) show the fluorescence intensity of HepG2 and Huh7 cells bound with the 04D10E8 antibody. This data demonstrates the binding specificity and expression level of the SLC13A5 membrane protein in these cell lines.

Request SLC Protein Expression

To request custom SLC protein expression, please contact a team member at support@kactusbio.us.
Our team is excited to help with your request and provide scientific support!